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With the writer's compliments.

*A Case of Brain Tumor Without
Characteristic Symptoms.*

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A CASE OF BRAIN TUMOR WITHOUT CHARACTERISTIC SYMPTOMS.

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THE following case is interesting from a negative standpoint, but one which will not materially strengthen, either theoretically or practically, the researches in cerebral localization; still it presents features which make it interesting and of sufficient importance to be the source of a few comparisons and conclusions.

It presents conditions which, according to the most recent theories, should produce very evident results. These results, however, are entirely absent, and we have one of those peculiar phenomena the negative effects of which can only be accounted for theoretically, and I do not think that any practical or reasonable explanation of such can be made.

The existence of a morbid growth was not suspected at all, as there were no signs or symptoms pointing to such a condition, except the existence of epilepsy, and this may arise from so many various causes that it would be ridiculous to suspect or diagnose a tumor in any particular part of the brain unless the convulsions were localized. I will give the history complete as it appears on the case book:

J. C., admitted December 7, 1886; male, aged 47; native and resident of Pennsylvania; single; no occupation; about five feet eight inches tall; rather thick set and fairly well nourished, but said to be losing flesh lately; heavy features, brown hair and eyes; eyes inflamed at inner canthi; tongue, bowels, temperature and pulse normal; talks in a slow, drawling tone; comprehends fairly well, but his memory is exceedingly deficient even for recent events; makes frequent misstatements; while talking makes motions continually as though drawing a thread through his fingers; conversation is disconnected; there is no known tendency to neurotic disturbances or insanity in the family. During 1876 the



patient had a severe attack of typhoid (?) fever, and a few months after convalescence became epileptic. The typhoid (?) fever was given as the cause of his insanity. The epileptic seizures have been increasing both in number and severity, and are both diurnal and nocturnal. During past eight or nine months has had especially violent attacks, alternating with periods of more or less stupidity. At certain periods he is inclined to be excited and even violent, and it is noticeable that this excited state is in inverse ratio to the number and severity of the epileptic attacks. During his excited period he destroys clothing and denudes himself. On one occasion he wandered away from the hospital. Is obstinate and tenacious in his demands and desires. Was treated for epilepsy in the University Hospital in Philadelphia in 1881, without permanent improvement.

Was brought to this hospital from New York City, where he had undergone an operation for double strabismus. Operation performed about ten days ago. No strabismus exists at time of admission. The diagnosis in this case was "epileptic mania."

December 27th.—Has had five "fits" (*grand mal*) since admission, on one occasion bruising face severely. For first few days was very much excited and troublesome to put to bed; lately has been orderly and quiet. Removed to a quiet ward.

January 6, 1887.—Is stupid and seems helpless; takes no care of himself; requires feeding with a spoon; confined to bed. Condition followed a period of excitement resulting from a series of fits; excited period lasted about a week.

March 3d.—Is quiet and orderly; causes no trouble; is in good physical condition.

June 8th.—During the past three months has had one fit each month.

Since admission there is the following record of epileptic seizures: In 1886—December, 10. 1887—January, 3; February, March, April and May, 1 each; June, 4.

From this date there is a gap in the history until December 24, 1888.

The only information I can get to fill this up is the record of the number of "fits" he had during this time, and from this it is fair to conclude that he remained in a stationary condition. The average number of epileptic seizures was about three a month, so undoubtedly his periods of excitement and depression varied accordingly.

Taking up the history again, we find, under December 24, 1888, the following entry:

Physical condition is excellent; mental condition stationary. While under epileptic treatment¹ he has but few convulsions, but if it is discontinued the attacks increase and he becomes irritable and excited. He always has some complaint to make to the physician either about the attendants or other patients. Goes out walking and works in the ward and about the grounds.

May 1, 1889.—Stationary.

July 9th.—Had an attack of dysentery, which was hemorrhagic in character from the first.

Death occurred on July 12th.

AUTOPSY (twenty-five hours after death).—Post-mortem changes had already begun. Body well nourished. Head only examined. Dura mater adherent to base of skull and somewhat congested, but beyond this normal. Pia mater opaque, thickened and much congested, particularly over the fissures of Sylvius. Marked adhesions in longitudinal fissure between frontal lobes.

Brain.—Weight fifty ounces. Cortex soft and adherent to pia mater. Decortication especially marked in anterior part of right frontal lobe and also over right temporal lobe. Entire gray matter of right temporal lobe soft and almost fluctuating; very much thinned at apex of lobe, so that in removal of brain it was ruptured, with the escape of a slight quantity of straw-colored serum. This fluid was found to have escaped from a cyst occupying the anterior part of the third temporo-sphenoidal convolution and the uncinat gyrus, and apparently was connected with the descending horn of the lateral ventricle. The cyst presented smooth, glistening walls and had a capacity of about fl 3 ii.

The anterior one-third of the second temporo-sphenoidal convolution was atrophied and diminished about one-third of its natural size. At the extreme anterior portion of this convolution was another cyst, somewhat smaller than the first and containing a clear serum. Bottom of sulcus between

¹ Bromide of ammonia,
Bromide of sodium, aa, gr. xv., } suspended in a tonic mixture t. i. d.,
and a pill of
Oxide of zinc,
Extract of belladonna, aa, gr. $\frac{3}{4}$, } at night.

first and second temporo-sphenoidal convolutions soft and greatly disintegrated, breaking down easily. First temporo-sphenoidal convolution soft and gelatinous in appearance in anterior part. Occupying the anterior part of third temporo-sphenoidal convolution was found a hardened mass, size of small hickory-nut, irregular in outline and nodulated. On removal it was found that there were four small growths, the size of peas, connected by fibrous bands with the large tumor.

Such is the complete history of the case and autopsy. Before I go further, let me briefly recapitulate the parts involved by the morbid growth and diseased processes:

I. Anterior part of third temporo-sphenoidal convolution occupied by a cyst and the tumor.

II. Uncinate gyrus filled to a great extent by a cyst.

III. Anterior one-third of second temporo-sphenoidal convolution atrophied and extreme end occupied by a cyst.

IV. Anterior part (about one-third) of first temporo-sphenoidal convolution softened.

In addition to this there was great destruction of gray matter in other parts of the lobe.

Ferrier makes the following statement:² "Among the reactions consequent on electrical irritation there is one the significance of which might almost be deduced *a priori*. The reaction in question is that which occurs on electrical irritation of the superior temporo-sphenoidal convolution, viz., pricking of the opposite ear, associated with wide opening of the eyes, dilatation of the pupils and turning the head and eyes to the opposite side."

He has by his many and varied experiments on animals shown conclusively that the centre for hearing is situated in the superior temporo-sphenoidal convolution, and that removal of this structure destroys the sense of hearing in the opposite ear; that complete destruction of this convolution in both temporal lobes will cause absolute deafness; and, finally, electrical stimulation of it will produce the so-called subjective sensations of hearing, as he mentions in the reference given.

Functions of the Brain, page 305.

In his conclusions he says:³ "In at least a dozen cases in which I have established the most extensive lesions in, or entirely removed the whole of the temporo-sphenoidal lobe, with the exception of the superior temporo-sphenoidal convolution, on one or both sides, I have obtained clear indications of the continuance of signs of perception of auditory stimuli, indicated by twitching of the ear and turning to the origin of slight sounds, such as tapping, scratching or whispering close to the ear."

I think Dr. Ferrier has proved conclusively, both from positive and negative standpoints, that the auditory centre is situated in the superior temporo-sphenoidal convolution; but either this centre is circumscribed or variable, or if it occupies the whole extent of the convolution, then my case was a unique one.

His experiments on animals have consisted in stimulation of, and partial or complete removal of, this convolution, and in all his cases he has produced some change in the auditory function. He has shown that stimulation by the battery produced *subjective* sensations of hearing. In the case under consideration there was no electrical stimulation, but in its place there was irritation of this convolution caused by the presence of a morbid growth and destruction of brain tissue, and it would be fair to expect either defective hearing or some subjective sensations of hearing, and, to go a step further, it would not have been unreasonable to expect an auditory aura, as there is no doubt but that the tumor was the cause of the epilepsy; yet, in spite of the extensive destruction of this centre, *there was absolutely no impairment in hearing*. The patient never made any complaint, and was always able to hear as well with one ear as the other.

Gowers⁴ cites a case of a large tumor of the temporal lobe, the most of it being situated in the superior temporo-sphenoidal convolution. In this case the patient was an epileptic, the convulsions being preceded by an auditory aura referred to the opposite ear.

³ Functions of the Brain, page 310.

⁴ Manual of Diseases of the Nervous System, page 454.

Dr. C. K. Mills⁵ cites another case of tumor of the first temporal convolution and Sylvian fossa, in which there were unilateral convulsions, and these were preceded by an auditory aura, resembling the rumbling of machinery, in the opposite ear.

Here we have two cases where there existed an auditory aura before the onset of an epileptic convulsion, due to the irritation of one of the auditory centres by a morbid growth, and designated as "subjective sensations" of hearing. Nothing of this nature was present in my case. There was no aura of any kind, nor did the man ever complain of hallucinations of hearing at any time. As a general rule, a person who is partially deaf in one ear will, under all possible circumstances, make the other member do the work. Then, again, had the patient been troubled by defective hearing, I am almost positive he would have mentioned it, as there was no pain or ache incident to the human race which he did not have (?).

I grant that this is only one case, and the fact of the great preponderance of evidence against it makes it seem to me to be a unique one. On the other hand, I think it is fair and reasonable to draw the conclusion that it is *possible* for extensive lesions to exist in about these centres without impairment of their special functions, or else the centres are so numerous and extensive that there can be loss or destruction of a number of them without producing serious results, or at least serious enough to manifest themselves.

Two other centres of special sense seemingly should have been involved by the tumor, cysts, etc., viz., those of smell and taste. Dr. Ferrier states⁶ that "affections of smell and taste are evidently related to lesions of the hippocampal lobule and neighboring regions." Besides these centres, those of common or tactile sensibility he locates in the hippocampal region. Dr. William Worcester, of the State Lunatic Asylum, Little Rock, Arkansas, reports the following case:⁷

⁵ Brain, October, 1889, page 393.

⁶ Functions of the Brain, page 320.

⁷ American Journal of Insanity, July, 1887.

Male, aged 30; had epilepsy for about three years. After admission had several severe convulsions, preceding which he had subjective sensations of smell, "at first constant, but of late transitory." Said he smelled smoke at night, and at other times he noticed an odor resembling the vapor of alcohol.

The necropsy revealed a focus of softening in the anterior part of the left temporal lobe, extending to the surface and also "involving the pes hippocampi in the floor of the descending cornu of the lateral ventricle."

In this case there was a disturbance of the olfactory centre of sufficient intensity to cause subjective sensations of smell, but there was no impairment of tactile sensibility, the centres for which are in all probability located in the hippocampal region. Drs. J. Hughlings Jackson and Charles E. Beevor report⁸ a case of epilepsy in which the patient, a female, had both ~~auditory~~ and visual aura before the epileptic seizure. In this case the autopsy disclosed a tumor of considerable size occupying the extreme tip of the right temporo-sphenoidal lobe, and consequently involving the olfactory centre on that side. In this case we have the cause, and the consequent effect, for there is no doubt but that the disturbance in the sense of smell was due to irritation produced by the growth. Here is the other peculiarity of my case. There was no impairment in the sense of smell. There were no "subjective sensations" of smell either before the epileptic seizures or at any other time. In both of the preceding cases there was disturbance of this function. In my case I can account for this theoretically in two ways: First, either there was total destruction of the right olfactory centre and the left nostril performed the function for both, or else there was not *sufficient* destruction of the cells in this centre to cause the disturbance. The first would not be strange, as the two nostrils are in such close proximity that one could assume the labor of both without being noticed by the person, while that of hearing (the organs being such a distance apart) would be easily noticed. Neither Dr.

refactory.

⁸ Brain, October, 1889.

Worcester's nor my own case would support the theory of the tactile sensibility centre.

A microscopical examination of the tumor showed it to be a fibroma. For the preparation of the section of the specimen I am indebted to my colleague, Dr. Hugh B. Meredith, of this hospital.

I only report this case to show how extensive trouble may exist in close proximity to these great centres and still cause no disturbance of their functions.

COMPARISON OF THE THREE CASES.

				PARTS INVOLVED.
CASE I.	Reported by Dr. William Worcester.	Epileptic for about three years.	Hallucinations of smell.	Left uncinate gyrus; white matter of left temporal lobe; pes hippocampi; small focus of softening in white matter of left frontal lobe.
CASE II.	Reported by Dr. J. Hughlings Jackson.	Epileptic for thirteen months.	Hallucinations of smell and sight.	Right uncinate gyrus; hippocampal lobule; entire anterior extremity of right temporo-sphenoidal lobe; central white matter of right temporo-sphenoidal lobe.
CASE III.	Reported by Dr. G. R. Trowbridge	Epileptic for thirteen years.	No disturbance of special senses.	Anterior part of third temporo-sphenoidal convolution; uncinate gyrus; anterior part of second temporo-sphenoidal convolution; anterior part of first temporo-sphenoidal convolution. (Right side.)

